REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested.

Minor formal changes are made to the specification.

Claims 1, 3-7 and 20-32 are present in this application. Claims 2 and 8-19 are canceled, claims 1, 6 and 7 are amended and claims 20-32 are added. Amended claims 1, 6 and 7 and new claims 20-32 are believed to be supported by the specification and thus no question of introduction of new matter is believed raised.

Claims 1, 4 and 5 are rejected under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) over JP 2002-226926 (Yamauchi) and claims 2, 3, 6 and 7 are rejected under 35 U.S.C. § 103(a) over Yamauchi.

The present invention as claimed in the present application is directed to a fuel cell catalyst material, a membrane electrode assembly and a fuel cell. Each of the material, assembly and fuel cell includes platinum-containing nitride particles as catalyst particles substantially represented by AT_xN_u where A, T and N contain various elements as recited in claims 1, 6 and 7, and the average diameter of the catalyst particles is 0.5 nm to 500 nm. At least a part of the platinum is present in the form of a nitride. The material, membrane electrode assembly and fuel cell having such catalyst particles are more efficient as compared to prior art materials, assemblies and fuel cells. Further, the catalyst particles with an average diameter within the range from 0.5 nm to 500 nm provide further improved characteristics of the catalyst.

Turning to the prior art rejections, Yamauchi describes in paragraph [0006] a functional composite material including a matrix in particles precipitated in or on the matrix, where the particles are made of a compound of a metal element X and a gas phase element Z. In paragraph [0012], when N is selected as a gas phase element, one or more of Ti, Zr, Al, Fe, Cr, Mo, V and Si is used as the metal element X forming a nitride, and one or more of Ag,

Cu, Ni, Fe, Pd, Co, Au, Pt, Cr, Mo, W, Ti and Zr is used as a metal element Y forming the matrix. That is, Yamauchi simply suggests the composite material of a platinum matrix and nitride particles containing Ti, Zr, Al, Fe, Cr, Ti, Mo, V or Si. Such a material clearly differs from the catalyst particles in claims 1, 6 or 7 having a composition substantially represented by AT_xN_u, where A contains Pt or Pt and at least one noble metal element selected from the group consisting of Ru, Pd, Au and Ag; and T contains at least one element selected from the group consisting of Fe, Co, Ni, Sn, Mn, Cr, V, Ti, Mo, Nb, Zr, W, Ta and Hf. Yamauchi does not suggest the platinum-containing nitride particles recited in claims 1, 6 or 7.

Claims 1, 6 and 7 also recite that the average diameter of the catalyst particles is 0.5 nm to 500 nm. The Official Action asserts that particle size is "clearly a result effective variable" and setting the particle size is simply optimization involving only routine skill in the art. Yamauchi discloses that the catalytic material comprises "fine particles" as stated in the Office Action. There is no suggestion of any range and thus the assertions made in the Office Action are without effect since there is no range being optimized in Yamauchi. It must be shown that the range recited in the claims could be obtained from the teachings of Yamauchi. To the contrary, Yamauchi gives no guidance on what range is appropriate and thus gives no guidance on what one skilled in the art would consider a routine optimization.

Moreover, as described in the specification on page 8, lines 2-14, reducing the size of the particles to the claimed range is not merely an optimization but provides remarkably improved characteristics of the material. Unless the Office Action can show objective evidence that the prior art would suggest the claimed range, or that one skilled in the art would optimize a range to reach the claimed range, the rejection on this basis must be withdrawn.

With regard to the rejection of claims 6 and 7, it is admitted that Yamauchi does not disclose a membrane assembly or a fuel cell. The Office Action goes on to state that it would be obvious for one skilled in the art to use the material in Yamauchi in membrane assemblies and fuel cells for the purpose of "catalyzing hydrogen gas in the anode." However, this "purpose" cannot be a motivation to achieve the claimed invention as use of a hydrogen storage layer in a catalyst layer of a membrane assembly or fuel cell does not make technical sense. Moreover, the platinum-containing nitride particles in claims 6 and 7 are not a hydrogen storage material. Without any motivation, the rejections of claims 6 and 7 cannot stand.

As Yamauchi does not suggest the platinum-containing nitride particles of the catalyst recited in claims 1, 6 or 7, contains no suggestion or disclosure of the claimed range of the size of the particles, and no motivation to use the disclosed material in a membrane assembly or a fuel cell has been identified, it is clear that claims 1, 6 and 7 are patentably distinguishable over Yamauchi. A favorable decision to that effect is respectfully requested.

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